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AUTHOR Eason, Sandra
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ABSTRACT

The Delphi process provides a technique for scientific inquiry within the context of group interactions by generating information and seeking a consensus through a series of interactive probes. In a study of the effects of power on the allocation of resources in the organizational setting of public elementary schools, the Delphi technique was used for the assessment of power. This paper describes the process from conceptualization to collection of data, with specific reference to background, rationale, and development of the probes. The inquiry was conducted through interviews with: (1) three male and three female principals; (2) three males and one female with positions as central office administrators; and (3) two male university faculty members. In all, the 12 persons interviewed consisted of 5 blacks and 7 whites. An initial probe was conducted by an interview exploring the ways schools influence district allocations. Questionnaires were used in three additional probes, each dependent on the previous probe. The final questionnaire assessed school power across 79 public elementary schools on 3 consensually shared dimensions as follows: (1) politically astute parents; (2) politically astute principals; and (3) participation of community groups in solving school problems. Results indicate the relative influences of schools on resource allocations in the district. It is concluded that the methodological qualities of the Delphi technique complemented the design of the study. A table presents descriptions of the panelists. A 13-item list of references and the 2 questionnaires used are included. (SLD)

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POWER ASSESSMENT AND THE DELPHI PROCESS

Sandra Eason

University of New Orleans 70148

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ABSTRACT

The Delphi process provides a technique for scientific inquiry within the context of group interactions. The process generates information and through a series of interactive probes seeks consensus. In a study that investigated the effects of power on the allocation of resources in the organizational setting of public elementary schools a Delphi was used for the assessment of power. The present paper describes the process from conceptualization to collection of data with specific reference to background, rationale, and development of the probes.

POWER ASSESSMENT AND THE DELPHI PROCESS

Among the numerous methodological techniques available for scientific inquiry is the Delphi process. The process generates information and through a series of interactive probes seeks consensus. The Delphi process was one of two methodological procedures employed in a study that investigated the effects of power on the allocation of resources in the organizational setting of elementary public schools. In the study data were collected on three sets of variables: Sources of Power, Power Assessment, and Resource Allocations. The Delphi process was the technique used to assess power. The present paper describes the process from conceptualization to collection of data. Included in the description is the background of the technique, a rationale for the applicability of the process to the study, and development of the interaction sequences.

Variability of resources exists among schools within school districts. Lack of instructional supplies or needed repairs is often in contrast to well-equipped programs and maintained buildings. While most allocations are bureaucratically formula driven, e.x., pupil/teacher ratio and Minimum Foundation Program, the allocation of discretionary resources does not adhere to set rules and procedures. Viewed from the context of a political model,

the present study examined the impact of power on resource allocations in elementary public schools. Resource dependency theory provides the framework for the investigation. The theory predicts that power accrues to schools that provide important resources to a school district. Conversely, the provision of important resources differentially affect power.

Delphi Process

The Delphi process assesses group opinions by utilizing representative experts who work toward consensus on an issue. Linstone and Turoff (1975) define a Delphi as "a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem" (p. 3). Similarly, North and Pyke (1969) define the technique as a "set of procedures for eliciting the opinion of a group of people, usually experts, in such a way as to reduce the undesirable aspects of group interaction" (p. 75). Developed in the 1950's by the RAND Corporation in an Air Force research project called "Project Delphi", the process has been used by business and industry (North & Pyke, 1969), education (Kurth-Schai, 1988), adult fitness (Murray & Jarman, 1987), among others. The technique involves three or four phases called probes whereby: (a) panelists, i.e., Delphi members, contribute information on an issue; (b) an understanding of an issue is reached; (c)

if significant disagreement, underlying reasons for the differences are explored; and (d) information is analyzed and presented back to the panelists (Linstone & Turoff, 1975).

Rationale

The decision to employ Delphi methodology in the present study was based on the process's inherent characteristics of design considerations, mode of communication, interactive nature, and versatility of focus. Consideration of design was important for two reasons. First, the design of a Delphi allows for flexibility in the type of data collected by the accomodation of different views of reality. The process of data collection is adaptable for either a structured research approach or an open-ended research approach. For example, if a Delphi is conducted to ascertain specific opinions, an unambiguous list of statements is presented to the panelists. However, if a topic is not clearly defined or further exploration is necessary, an open-ended interview is more appropriate.

The latter example of reality reflects the focus of the present study. Interviews were conducted that consisted of an open-ended approach with general questions. The approach allowed for the development of school power dimensions which were a prerequisite to the assessment of school power. With previous research on power and resource

allocation conducted at the higher education level, power criteria at the elementary school level lacked a theoretical framework. School power could not be assessed without first the development of criteria that constituted school power. Moreover, research (Pfeffer, 1981) suggests that power is context specific. Variables that contribute to power in one setting may be different to power variables in another setting. Thus, flexibility in the development of dimensions of school power in a specific school district was an important component of the study.

Second, the design of a Delphi allows for a refinement of the dimensions. The refinement process occurs as dimensions are generated by panelists and through iterations consensus is reached. The importance of this characteristics is reflected in a unified concept of the dimensions of school power.

For the present study, reality was viewed from a political framework in which coalitions, characterized by diverse goals and interest, operate. Reality is defined as "the product created out of intentions and actions instead of an external basis for intelligent actions" (Scheele, 1975, p. 43). In other words, reality from a political view consists of what actually occurs, i.e., "intentions and actions," as opposed to a rational view that is characterized by bureaucratic rules and procedures, i.e., "external basis for intelligent actions." Intentions and

actions are termed "knowable reality." Scheele (1975) suggests that "knowable reality" is in competition with other conceptions. Thus, for the present study political reality is in competition with rational reality. Similar concepts of theory-in-use and espoused theory are presented by Argyris, Putnam, and Smith (1987). Delphi methodology was adapted to include interviews that more clearly described the political view of "intentions and actions."

The data collection mode of interviewing is congruent with a Delphi's inherent characteristic of communication versatility. Frequently presented as questionnaires, a Delphi is not exclusively limited to that format. Presentations can be communicated to panelists in a variety of forms that include statements (Foster & Kozak, 1986), visuals (Kurth-Schai, 1988), and verbals (Scheibe, Skutsch, & Schofer, 1975). The present study utilized the verbal communication mode of interviews for the initial probe, followed by a series of questionnaires. The interview/questionnaire format is a Delphi procedure recommended by Ludlow (1975).

A Delphi inquiry was also determined to be justified for the present investigation based on the interactive nature of the process. Interaction begins with the creation of a panel. A panel is often formed through the solicitation of names for potential members. The concept is based on the assumption that combined insights of

several experts are better than insights of a single expert. Interaction of Delphi panelists, however, is unlike the usual concept of group interaction. North and Pyke (1969) note that a Delphi capitalizes on the positive aspects of group interactions while avoiding the negative aspects of group negotiations. For example, a group is often dominated by a member that is more prestigious or more vocal than other group members. Equal contributions are likely to be limited and group opinion is relegated to "compromise" rather than "consensus" (North & Pyke, 1969). However, in a Delphi, divergent views have freedom of expression. A panelist can state an opinion without fear of ridicule or reprisal.

Moreover, research suggests that the dynamics created by the interaction is a motivating aspect of the process. Interactions, through the feedback of responses, provide opportunities for panelists to respond to issues raised by other panelists, and to "synthesize creatively their thoughts with those contributed by others" (Kurth-Schai, 1988, p. 56). Thus, Delphi interactions uniquely occur as panelists make comparisons relative to individual and group perceptions.

Finally, the fourth characteristic that justifies Delphi methology is versatility of focus. Although often used in forecasting, the process is not limited to one area of study. The Delphi process can "contribute to the store

of knowledge, enlarge a society's understanding of itself, and improve the style of governance in an idiomergent culture" (Scheele, 1975, p. 51). In the present study the process focused on enlarging the knowledge base of school power. In addition, the study provides a better understanding of the relationship of schools and school districts with respect to resource allocations.

In summary, inherent in the process are the characteristics of design flexibility which facilitated criteria development within a political framework; mode of communication which allowed for the dual role of interviews and questionnaires; the interactions which enabled consensus; and versatility of focus which contributed to the knowledge base of school power.

Delphi Panelists

The present Delphi inquiry was composed of individuals from three areas of education: principals, central office administrators, and university faculty. Inclusion of the three areas was based on a decision that a broader perspective of school power was more appropriate for the present exploratory study than a narrower perspective limited to one group of individuals. Theoretically grounded, research suggests that a successful "mix" of panelists is important to a Delphi process. Scheele (1975) notes that panels should include experts, individuals who have a specialty or experience; stakeholders, individuals

who will be directly affected; and facilitators, individuals who have skills in organizing and synthesizing. Furthermore, Scheele (1975) suggests that individuals who can supply a global view of an issue are important members of a Delphi.

For the present study principal panelists reflected the insights attributed to experts as well as to their role as stakeholders. In the dual role, expertise of school-level experience, i.e., practitioner knowledge, was combined with the role of a stakeholder who is directly affected by a district's allocation of resources. Central office administrators served the role of facilitators and offered a district perspective of resource allocations. Lastly, university educators provided a more global view that transcended the school/school district perspective. Thus, a wide spectrum of panelists offered unique views of district resource allocations.

Following the conceptual development of the panel, procedures were established for the selection of individual panelists. First, names of individuals were solicited from various educators familiar with the school system. Criteria for submission required that an individual (a) be an expert with a practitioner knowledge base relative to the operation of schools and the school district and (b) have at least four years of experience in the district. Moreover, a determination was made to have representation

from each of the district's three areas. From the lists of names submitted, letters were sent to 12 individuals. Each letter explained the purpose of the study, the Delphi process, and an explanation as to a panelist's role. Individuals were informed that they would be contacted by telephone for verification of participation and for arrangement of an interview. Accompanying the letter was a consent form that guaranteed anonymity and confidentiality. Of the 12 individuals contacted, each agreed to participate.

Representation on the panel provided for diverse and experienced perceptions. Composition of the Delphi panel and demographics are presented in Table 1. The twelve individuals, having worked a number of years in the school district ($\bar{X}$ = 16.67), were considered to be experts knowledgeable about district operations.

Interview Probe

For the present study the Delphi process contained four probes. The first probe consisted of an interview that explored "ways schools influence district allocations." Structure of the interview was designed to elicit factors that influence school power as well as to provide insights into the concept of school power. Development of the questions proceeded through several iterations. To insure that the format and the questions were unambiguous a pilot interview was conducted and

revisions were made. A semi-structured interview format was employed in the present study.

Six principals, four central office administrators, and two university educators were interviewed. At the beginning of each interview the purpose of the Delphi, scope of involvement for panelist, and an opportunity to ask questions was provided. The procedure was based on research which suggests that an orientation period prior to an interview makes panelists feel more comfortable and more cooperative (Downs, Smeyak, & Martin, 1980; Goetz & LeCompte, 1984). The interviews, averaging 30 minutes in length, were audiotaped and transcribed. Data analysis was guided by the analytic strategy of constant comparison (Glaser & Strauss, 1967). Analysis began with an initial search through the transcripts. Coding was used to categorize similar perceptions of power. Within categories data were constantly compared. A range of meanings resulted in the refinment of the dimensions. Coding of the dimensions yielded thirteen school factors perceived to influence district allocations.

Questionnaire Probes

Following the initial interview probe, questionnaires were utilized for the second, third, and fourth probes. The sequential development of each questionnaire proceeded with the following general guidelines: (a) Each new questionnaire was dependent on information derived from a

previous probe, (b) individual panelists received their prior responses in addition to group responses, and (c) the number of categories were reduced with each iteration.

Panelists received each questionnaire through the mail in the form of a packet. Included in the packets were a letter that stated the purpose of the Delphi probe, responses from the previous probe, and a new questionnaire. Self-addressed, stamped envelopes were provided for the return of each questionnaire. To stimulate response and enhance continued participation, careful consideration was given to the design of the packet materials with regards to the quality, style, and presentation. Scheele (1975) suggests, "What you send out reflects the significance of the inquiry and the value that is placed on it" (p. 69). Pagemaker, a desktop publishing computer program, was utilized for the questionnaires. All documents were lazer printed. For continuance in the Delphi inquiry, a panelist's perception from a previous probe was used whenever a response was not received.

A reduced version of a questionnaire packet is presented in the Appendix to give the reader a visual conceptualization of the process. The first questionnaire contained 13 codified interview dimensions perceived to be ways schools influence district resource allocations. Panelists were asked to indicate their perception of each factor's influence and the strength of the influence.

Space was provided for personal comments to clarify or substantiate a perception. By actively encouraging further input from panelists, research suggests that the potential for significant researcher bias is low (Kurth-Schai, 1988; Linstone & Turoff, 1975).

In the second questionnaire the number of school factors that influenced allocations were reduced to 12. One factor fell below an 80% criteria of support and was eliminated. Panelists were asked to (a) rank each factor in order of importance and (b) rate each factor's importance to the district. Space was again provided for comments.

The final questionnaire assessed school power across 79 public elementary schools. The 12 dimensions derived from the previous probe were reduced to five of the most important statements. Reduction of the dimensions was based on a mean ranking of 5 or below with "1" indicating the most important influence and "12" the least important influence. Finally, the five remaining influences were categorized into three primary dimensions due to similarities of influences. Panelists were informed that their ratings should reflect current perceptions of schools within the last two to three years. Power was assessed across the three dimensions for each school.

Results

The three dimensions consensually shared by the panelists were (a) politically astute parents, (b) politically astute principals, and (c) community groups' participation in solving school problems. Correlations among the dimensions were .80 or above with parents correlated highly with community (r = .92). Analysis indicated that principals were perceived to be more influential ($\bar{X}$ = 138.75) than parents ($\bar{X}$ = 127.42) or community ($\bar{X}$ = 119.83). Results of the power assessment, with ratings from "3" a weak influence to "9" a strong influence, indicated that 64.6 percent of the schools were perceived to be weak ($\bar{X}$ = 4.13), 24.1 percent of the schools were believed to have a moderate influence ($\bar{X}$ = 5.84), and 11.4 percent of the schools were thought to have a strong influence on resource allocations ($\bar{X}$ = 7.92). The mean served as the power assessment indicator for the study.

In conclusion, the methodological qualities of a Delphi complemented the design of the study. The technique provided for the development of power dimensions and subsequently for the assessment of the dimensions across the schools.

Table 1
Demographics of Panelists

Panelist	Sex	Race	Years in District ($\bar{X}$ = 16.67)	Years as Principal ($\bar{X}$ = 11.67)
Principal 1	male	black	14	10
Principal 2	male	black	27	16
Principal 3	female	black	21	11
Principal 4	female	white	28	10
Principal 5	male	white	18	12
Principal 6	female	black	18	11
Central Office Adm. 1	male	white	10	-
Central Office Adm. 2	male	black	15	-
Central Office Adm. 3	male	white	20	-
Central Office Adm. 4	female	white	9	-
University Faculty 1	male	white	9	-
University Faculty 2	male	white	11	-

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APPENDIX

Code # _____

Questionnaire

(Instructions were eliminated so more of the questionnaire format could be visually presented.)*

1. Parents with effective communication skills influence district resource allocations.
(can ask "tough" questions, persistent, gripe and complain in a way the system can accept)

Is an influence? Yes ☐ No ☐ | Strong influence 1 2 3 4 5 6 7 Weak influence

_____

_____

_____

2. Politically astute parents influence district resource allocations.
(knowledgeable about school system operations, have the ability to know how to apply various types of pressure such as visibly active attendance at meetings or quiet internal lobbying, coordinates activities with others)

Is an influence? Yes ☐ No ☐ | Strong influence 1 2 3 4 5 6 7 Weak influence

_____

_____

_____

3. Monies raised by parent groups and/or business partners provide leverage to obtain resources from the district.
(negotiate, "cut a deal", example: Air conditioners purchased by parent organization; district wires school.)

Is an influence? Yes ☐ No ☐ | Strong influence 1 2 3 4 5 6 7 Weak influence

_____

_____

_____

4. Principals with political skills influence the distribution of district resources to their school.
(develop professional and civic connections, know how often to complain, lobbies internally on a quiet basis, "covers all bases," is a facilitator for parents, political favors, savvy)

Is an influence? Yes ☐ No ☐ | Strong influence 1 2 3 4 5 6 7 Weak influence

_____

_____

_____

*Note: Total questionnaire contained 13 dimensions.

Code # _____

Responses from Questionaire # 1

Below are results of the first questionnaire of school influence on district resource allocations. Your responses to the strength of an influence is indicated under "Personal." Please review before responding to questionnaire # 2. Provide any additional comments to support your opinions or comments that will provide more input.

	Is an Influence	Strength $\bar{X}$	SD	Personal
1. Parents with effective communication skills influence resource allocations.	100%	2.5	1.4	___
2. Politically astute parents influence district resource allocations.	100%	1.8	.9	___
3. Monies raised by parent groups and/or business partners provide leverage to obtain resources from the district.	100%	2.6	1.4	___
4. Principals with political skills influence the distribution of resources to their school.	100%	2.1	1.0	___
5. The reputation of the principal is a factor that influences district resource allocation decisions.	91%	3.4	1.4	___
6. Effective communication skills of a principal influence resources a school gets from the district.	91%	3.2	1.7	___
7. The formation of coalitions influences district resources allocated to schools.	82%	3.1	1.9	___
8. A school's community influences resources obtained by a school from the district.	100%	2.7	1.8	___

*Note: Total responses included 13 dimensions.

Code # _____

Questionnaire # 2

(Instructions were eliminated so more of the questionnaire format could be visually presented.)*

	Influence Ranking	Importance to District
1. Parents with effective communication skills influence resource allocations.	___	Strong 1 2 3 4 5 6 7 Weak
2. Politically astute parents influence district resource allocations.	___	Strong 1 2 3 4 5 6 7 Weak
3. Monies raised by parent groups and/or business partners provide leverage to obtain resources from the district.	___	Strong 1 2 3 4 5 6 7 Weak
4. Principals with political skills influence the distribution of resources to their school.	___	Strong 1 2 3 4 5 6 7 Weak
5. The reputation of the principal is a factor that influences district resource allocation decisions.	___	Strong 1 2 3 4 5 6 7 Weak
6. Effective communication skills of a principal influence resources a school gets from the district.	___	Strong 1 2 3 4 5 6 7 Weak
7. The formation of coalitions influences district resources allocated to schools.	___	Strong 1 2 3 4 5 6 7 Weak
8. A school's community influences resources obtained by a school from the district.	___	Strong 1 2 3 4 5 6 7 Weak
9. A willingness by the principal, parents, and/or community to participate in the solution to a school's problems influences district allocations of resources.	___	Strong 1 2 3 4 5 6 7 Weak
10. The reputation of the school influences resources allocated by the district.	___	Strong 1 2 3 4 5 6 7 Weak

*Note: Total questionnaire contained 12 dimensions.